$1.00

ROTUNDA

Winter 1972
Volume 5, Number 1

WEST AFRICAN ART
FOSSIL DYNASTIES
A PERSIAN PALACE REBORN

ROTUNDA

the bulletin of The Royal Ontario Museum
Volume 5, Number 1, Winter 1972

Contents

Spotlight with the Editor *Past, present and future at the* ROM **2**

West African Art and Artifacts *An ethnographic collection Kathleen Wood* **5**

The King's Tiger *Record tiger bagged by* ROM *Patricia Proctor* **20**

The Rise and Fall of Fossil Dynasties *Madeleine A. Fritz* **22**

Recent Publications **30**

Palace in a Tepe *Life returns to a Persian chateau L. Golombek* **31**

The Growing Collections **42**

Index 1970-1971 *Articles and authors* **46**

Published quarterly by the Royal Ontario Museum, 100 Queen's Park, Toronto 181, Ontario.
Subscription $3.00 a year. Single copies $1.00 each.

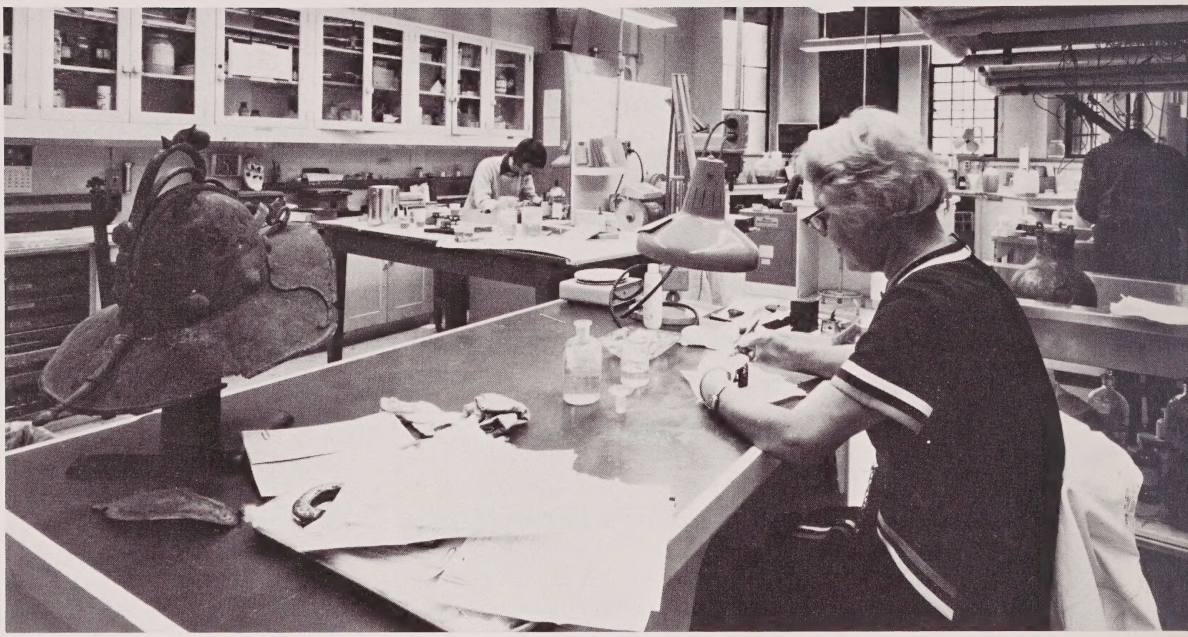
Editorial Staff:
P. C. Swann, Managing Editor;
Alex MacDonald, Editor;
Carol Kanter, Associate Editor;
Olive Koyama, Associate Editor;
Ursula Young, Editorial Assistant;
Leighton Warren, Chief Photographer;
Marie Hands, Designer.

Second class mail registration number 1531

The cover: Mask from Niabwa tribe, Ivory Coast. See story on page 5. Photograph by Leighton Warren.

Spotlight with the Editor

Past, present and future at the ROM



Conservator Carol Jack at work in the William Todd Conservation Laboratory.

ROM IS 60 NOW

1972 marks the sixtieth birthday of ROM, its Diamond Jubilee. Sadly there will be no great exhibition of diamonds—security and insurance problems prohibited the idea. There will, however, be an outstanding range of exhibitions and other activities.

Most notable will be "Hidden Treasures," a showing of important and beautiful objects for which there is normally no display space, which is organized by the Art and Archaeology Departments, and "ROM—Nature's Biographer," an exciting display conceived by the Science Departments. "Hidden Treasures" opens May 9; the Science show on August 22.

Other major showings include Paul Kane paintings and related Indian artifacts which is already showing until February 7, Emily Carr which opens February 15 and, later in the year, "Japanese Treasures," opening December 5.

Add to this a wide selection of smaller exhibitions in the Lower and Third Floor Rotundas throughout the year, several lecture

series, films, special shows in the Canadiana and Textile galleries, an evening concert series and Romarama in the fall.

It's a busy way to hold a birthday party but then we've never had a Diamond one before.

AFRICAN ART

An article on page 5 of this issue describes a ROM collection of African artifacts. This is not to be confused with a more recent addition to the Museum's Ethnology collections which was the result of corporate generosity.

A grant of $10,000 by Imperial Tobacco Products Limited has made possible the purchase of an outstanding collection from West Africa. The group of 35 items is now on view in a newly constructed display in the Ethnology galleries.

Most of the pieces are masks and helmet masks of religious or ritual purpose from the Mossi and Boba tribes of the Upper Volta region. There are also wooden carvings of a crocodile, a serpent and a female figure. This last item stands 41 inches tall; indeed the collection consists mostly of large pieces. In addition there is some bronze jewellery and two very old yellow and blue bead necklaces that are of Arab origin.

WILLIAM TODD CONSERVATION LABORATORY

The Museum's conservation laboratory has been named in memory of William Todd, Chief Conservator of the Royal Ontario Museum until his death in 1963. Born in Toronto in 1911, Mr. Todd became one of the outstanding experts in museum conservation work on this continent.

William Todd's mind was always open to developing and improving methods of conservation, and his paper, "Vacuum Process for Preservation of Bone and Ivory" was one of the early reports on this method of dealing with these fragile materials.

Fourteen years after ROM was founded, Mr. Todd became part of the staff working under his father, the late John Todd, who was a cabinet maker. Having grown up with ROM, his overall knowledge of the collections of the art and archaeology divisions was unparallelled. He was largely responsible for founding a separate Conservation Department at ROM in 1957, formerly part of the Preparators' Department.

William Todd was a fellow of the International Institute for Conservation as well as a founding member of the American group of IIC.

MUSEUM NOTES

The British Museum's Society of Members, founded three years ago, now numbers over 3,000. It has formed an influential body of opinion which has played a large part in obtaining free admission, and in persuading the government of the day to revise its plans for separating the BM from its Library, and to finance a much-needed extension to the Museum itself—a development awaited almost as long as the ROM extension! ROM members now number 4,000 strong. Will they form an equally influential body of opinion?

The Director reports that he has hopes that the Purchase Trust Fund started in March 1967 will reach its target of $500,000 by March 1972. A very successful Group of 100 dinner on November 22 was attended by many eminent supporters of the fund.

Kay Wood of the Ethnology Department examines a hand mask of the Mossi tribe. A Guere mask can be seen in the foreground.

Clay pipe bowl with swollen-cheeked face, surmounted by interwining snakes. Cameroon grasslands, Bamun tribe

Dogon figure, French Sudan, Bandiagara region

WEST AFRICAN ART AND ARTIFACTS

An ethnographic collection from West Africa

Kathleen Wood, Ethnology Department

ROM *photographs; colour by L. Warren, others by A. Williams*

Picasso, Braque, Matisse and other painters at the beginning of the 20th century, in their search for new forms of expression, were the first to recognize African styles as art. African examples undoubtedly acted as a catalyst in the development of Cubism and Surrealism and other post-Impressionist developments in Western art. But with the African craftsman, whatever function a piece might have—economic, socio-political or magico-religious —the aesthetic principle never became an end in itself, in the matter of "art for art's sake." African sculpture in most, if not all, cases was designed for a pragmatic reason.

Recently, the ROM Ethnology Department acquired a collection of 137 items from West Africa, important not only from an ethnological point of view, but also often superb works of art. The collection was assembled by Mr. Harry Rayfield, who visited remote villages in West Africa, and obtained masks, drums, ancestor figures and other ritual items, gold weights,

Bronze gold weights. Ivory Coast, Baule tribe

Anthropomorphic mask used to appease evil spirits, Ivory Coast, Niabwa tribe

chiefs' regalia, jewellery and ceremonial clothing representative of Upper Volta, the Cameroons, Ghana, Mali, Nigeria and the Ivory Coast.

West Africa is composed of two culture areas, the Guinea Coast and the Western Sudan, and each is represented by items in the collection. The Guinea Coast Culture Area extends along the coast in a strip several hundred miles wide. The Western Sudan Culture Area lies beyond.

The Guinea Coast Culture Area is typically equatorial, with heavy rains, high temperatures and a persistently high humidity. The shoreline

Female spirit mask of Mmwo Secret Society. Nigeria, Ibo tribe

Male and female ancestor figures. Ivory Coast, Baule tribe

is mainly low, sandy and without natural harbours. Stretching along the coast and encompassing thousands of square miles, the equatorial forest is broken only in the region of the Volta River. To the north it grades into deciduous forest.

In these forested lowlands, horticulture requires slash-and-burn cultivation, a technique in which sections of land are cleared by burning the trees. But because of heavy leaching by the tropical rains, crops can be grown for only a few years. The fields are then abandoned and new areas cleared. Using slash-and-burn techniques, the Guinea Coast peoples grow cassava, yams, various vegetables, bananas, pineapples, maize and rice.

Poro Society mask. Ivory Coast, Dan-Guere tribe, Banhoukouma, village near Man area

The people inhabit villages composed of rectangular huts with long, low pitched roofs of palm-leaf thatch or corrugated metal. The walls are of mud brick or palm leaves covered with 'banco' or mats attached to a framework. Markets, held in the villages one day a week, are among the most important social as well as commercial elements of village life. Social and political forms vary widely, from large political states such as those of the Yoruba and Dahomey to societies organized on a much smaller scale such as the Kru and the Ibo.

Elaborate ancestor rituals are a notable feature of the Guinea Coast Culture Area. Among the Ibo of Nigeria, a society exists called the *mmwo*, meaning soul, since the performers are or were supposed to be the dead who had returned to earth to assure their families of their safe arrival and happiness in the spirit-land. No women are ever allowed to be members and, as a rule, they regard the society with the utmost dread. The members wear a mask that is usually painted white. Its sunken cheeks, slit eyes and thin lips revealing the teeth remind one forcibly of a death mask. The Baule carved elegant small commemorative figures in an attitude of repose with elaborate coiffure and decorative cicatrices in relief. The surfaces were carefully smoothed, polished, blackened and anointed with fat. These figures were designed to recapture the soul of the deceased and keep it locked within so that it could not wander about and bring harm to the living.

While most of the people of the Guinea Coast Culture Area believed in a supreme being, they also worshipped a pantheon of lesser gods. One such is Gbekre or Mbotumbo, a god with several tasks. He is judge of hell, helper to those in need, and protector of the living against their enemies. He is also an agricultural god, playing his part in the harvest festival.

The Baule were masters in the art of bronze casting by the *cire perdue* or lost wax method. The several examples in the collection are miniature works of art: a scorpion with long curved tail, a mythical fish-like creature forming an arc with its many-finned curved body,

Setien, *over 5' tall, represents the forces of the universe—life, death and fertility*

an elephant with long horned trunk, cubes with abstract decorations, and a leopard devouring an antelope.

The Western Sudan Culture area lies north of the Guinea Coast Culture Area and has its own distinctive environment and native cultures. As the rainfall decreases northwards, the hot wet forests of the south give way to deciduous forests, which in turn are replaced by savannah. Still further north semi-desert conditions occur, characterized by dry savannah and scrub. Most of the people of this culture area are cattle owners, especially the Fulani of northern Nigeria. Horticulture is engaged in, too, although the farmers are generally poorer than those of the forest zone. The main crops are guinea corn, maize, yams, cassava and millet. Groundnuts are the chief commercial crop.

The people live in round houses with thatched roofs, enclosed in compounds. Many groups are Moslem and through migrations and contacts have helped to spread Islamic beliefs throughout this region and south into the Guinea Coast Culture Area. Societies vary in size and organization from small autonomous groups to large kingdoms and empires. Trade centres, such as Kano and Timbuctoo, have been important for centuries and are focal points for a considerable north-south trade, as well as east-west contact.

The secret societies of the Western Sudan Culture Area were highly elaborated. Among the Mende and many neighbouring groups in Sierra Leone, Liberia, Guinea and the Ivory Coast the most powerful of these societies were the Poro (for males) and the Sande (for females). These societies included nearly all adults and functioned as law enforcement agencies.

Animal figures encrusted with cowrie shells

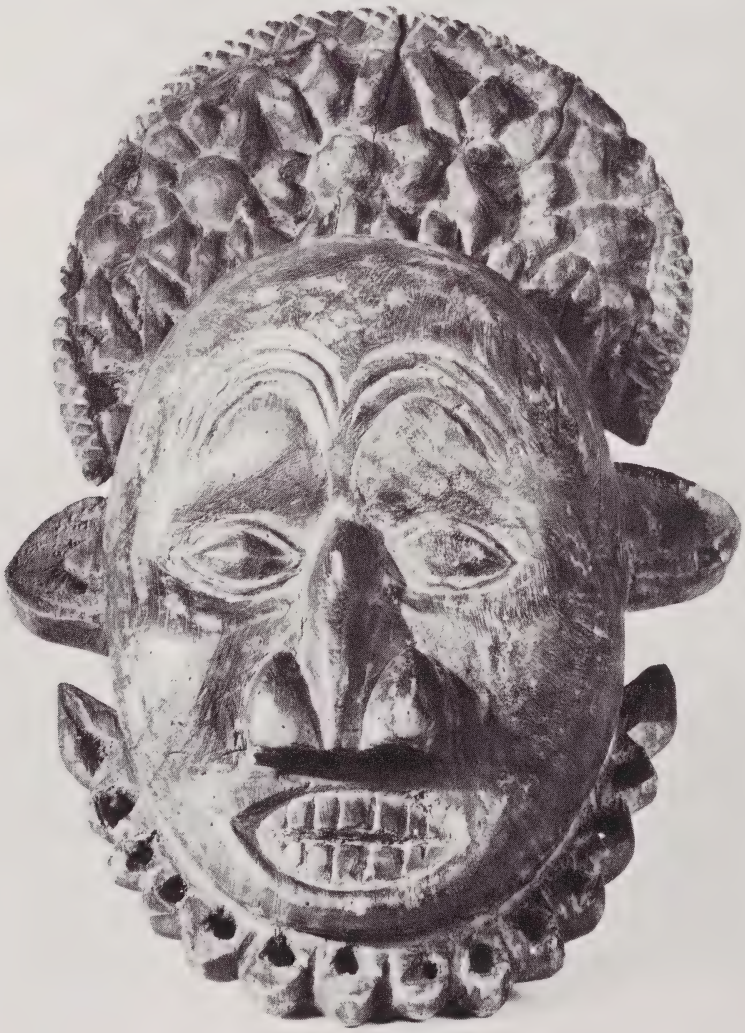
Mask with headdress of spiders, symbolic of wisdom. Cameroon Grasslands, Bikom tribe

Portrait mask, used in commemorative ceremonies for the dead. Representative of a particular individual, recognizable by the facial scarification and form of headdress.
Baule tribe, Dimbokro area

A major feature of the secret societies, the initiation or "bush" school, prepared immature boys and girls for life as fully mature members of the adult community. In the Poro Society, the initiate was taught from the time he entered the school the rules of the society and the social regulations of the community in which he lived, its laws and customs, farming, native crafts, hunting, fishing, acrobatics and drumming and singing Poro songs. The boys passed through three consecutive grades, each culminating in its own ceremony, and having its own masks and paraphernalia. The Poro Society controlled the periods of fishing and harvesting, regulated trading and judged important disputes in secret tribunals.

So that all members of the secret society might have access to the protective powers of the large masks, each member was presented with a small duplicate. Men wore them under

Naturalistic, roughly-carved mask with serrated rows of teeth from the Bamun tribe



their arms where they could not be seen by the women, or carried them in their pockets, and fed them with sacred kola nuts. In cases of sickness they even made them sacrificial offerings of rice and oil, so that they could be afforded aid and protection. Several of these small Poro masks, obtained from the village of Gbenda near the Liberian border, are in the collection.

The large masks were guarded by the priests. One such in the collection comes from the Dan-Guere tribe. It has white painted coffee-bean shaped eyes, triangular incisions on the forehead, a red lower face framed by black fibre and clumps of cotton to simulate curls. Another from the same area is painted black, white, and brown, the face is outlined with black cotton balls and a red cotton pad is secured under the chin to which is attached pendants of shells.

Among the Senufo, the *lo* society existed in every village and gave a structure and unity to the group even beyond the closer ties of kinship. It also functioned as an age-grade society, in which all the young men born within a few years of each other rose together through three ranks. Each rank lasted seven years, and the passage from one to another was marked by initiation rites and ceremonies. In the first stage, discipline was begun; obedience and tradition were taught through song and dance. In the intermediate rank the adolescent was taught his moral obligations to the village, was introduced into army service and might legally marry if he pleased. In the final rank he participated in major ceremonies that gave him a deeper understanding of the mythical and religious traditions of the tribe.

A large impressive hornbill sculpture called *setien* comes from a Senufo village near Lataha, Korhojo region. The sculpture stands 62 inches high. It is thought to be symbolic of the living forces of the universe. The beak, a phallic symbol, joins the pregnant woman's convex womb, representing the male and female components of increase. The spread wings convey the idea of man poised between two worlds, life and death.

In the Cameroon Grasslands, in the south-

Gbekre, judge, protector and agricultural god, holds a small alms bowl. Such figures generally have a thick coating of offerings. Guinea Coast

Helmet mask, Senufo tribe,
Upper Volta. Bovine figure
with three birds on its hindquarters

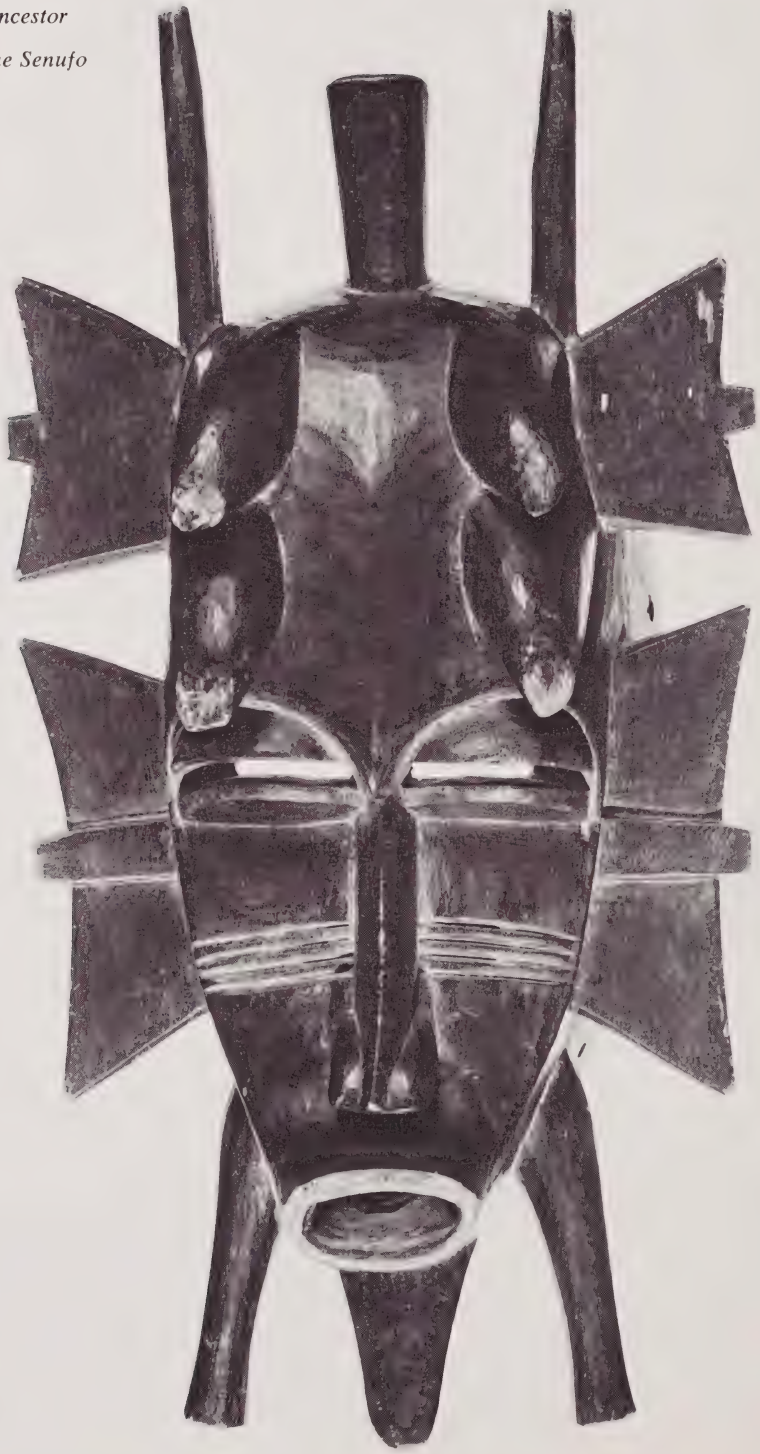
western part of the Sudan Culture Area, live both agriculturists and cattle herders. The grasslands form a plateau crossed by mountain ranges interspersed with fertile valleys. While much of the sculpture from this area is devoted to secular purposes, other carvings are associated with secret societies whose membership is limited to the chiefs and elders of a village. The elders' sons occupy a lower grade of the society and act as secret police in carrying out the orders of their leader. The carvings used in their societies are large in size and bold in conception. Some of the most powerful of African sculpture in the expressionist mode are to be found here.

The Bikom tribe are represented in the collection by an animal mask, in larger-than-life sculptural form with deeply ridged face, conical protruding eyes, large open mouth with bared teeth and openwork headdress of interlocking stylized spiders. From the Bamun tribe, Foubam region, Kootaba village comes a mask with semi-circular headdress, openwork scalloped edges around the lower cheeks and semi-circular protruding ears. North of the Bamun live the Bali, noted for elephant masks having a stylized head, upright ears and long trunk. From west of Bafoussam comes a large Bamileke wooden drum supported by chameleons, their legs arranged to form an openwork pattern. The drum was obtained from Chief Kanga of the village of Mbouda, who had replaced it by a drum resting on cows' heads in recognition of the superior fertility of his cattle.

Besides secret societies and ancestor worship, magic played a pronounced part in the lives of the people of West Africa. Magic could be "good" (white) in the hands of a priest and conducted for the benefit of the community, or it could be "bad" (black) when controlled by magicians and witch-doctors and practised in secret. From the Senufo came a fetish figure (*kafigueledio*) used in black magic. It consists of a roughly carved wooden figure with only the feet showing. The rest of the body is covered loosely with burlap drawn tightly together with a cord at the neck. Above this toward the top of the head the burlap

Bamileke wooden drum supported by chameleons

Kpelie *mask represents an ancestor closely connected with the origin of the* lo *society of the Senufo*



Small Poro *masks from Gbenda near the Liberian border*

flares out in an inverted triangle crowned with chicken feathers and porcupine quills. The cloth is stiff with sacrificial animal blood. Little wrapped bundles filled with magical substances are tied to the figure, adding to its magic power. We can suppose that in the course of a secret session, the operator by pointing the arms of the figure at a particular individual threw an evil spell upon him.

Other items in the collection having ritual associations include two animal figures covered with cowrie shells, from the Bobo tribe in the Upper Volta. These were only brought out at the death of the owner. From the Niabwa tribe of the Ivory Coast comes a grotesque and highly abstract mask used with the appropriate sacrifices in a ceremony to appease those spirits which might bring disaster to the group. From the Guere, Ivory Coast, comes a mask representing the great forest spirit. The violent composition of this mask attempts to show the spectators a creature of another world.

Africa is now in a state of drastic change, and accepted values and beliefs are undergoing radical alterations in many instances. The old traditional religious beliefs have been giving way to Islam and Christianity. West Africa's economy has for centuries been chiefly rural. The great majority of the population have been farmers occupied in cultivating crops for export or subsistence and in herding and fishing. But since World War II, the youth have been drifting to the towns and a new way of life. Industrialization is transforming the economy. The traditional crafts having real meaning to the people will soon be things of the past, to be seen only in museum collections such as that recently acquired by the ROM.

In 1958, Kathleen Wood joined the staff of the Department of Ethnology, ROM. She studied world ethnology with Dr. E. S. Rogers, Curator of the Department, and was placed in charge of the Ethnology collections. With over 60,000 items in the collections representing hundreds of different peoples and their cultures from around the world, she commands a unique view of mankind, and of the lively, positive statements all people make through their ritual objects. Since the foregoing article was written several more shipments of African material have been added to the collections making them, in Mrs. Wood's view, among the most important African holdings on the continent.

THE KING'S TIGER

Record tiger bagged by ROM in Toronto

Patricia Proctor

Curatorial Assistant
Far Eastern Department

Scholars in the Far Eastern Department, studying written records of Chinese royalty more than three thousand years ago, have uncovered a unique trophy of a royal tiger hunt. The trophy is a bone from the ROM's Shang dynasty oracle bone collection, one of the largest and finest outside China.

Oracle bones were used to divine the future for the kings of the Shang dynasty, the first historical period in China. Specially prepared shoulder blades of oxen or tortoise shells were heated so that a vertical crack with a horizontal branch-crack formed. The angle of the branch-crack was the omen. The question asked of the bone was inscribed in it with a bronze or jade knife. These inscriptions, the oldest existing form of the Chinese language, are the primary source for the study of the Shang dynasty and

the development of the Chinese language. However, not all inscribed bones are divinations. Often records of important events were inscribed on ribs and other bones. This bone in the Museum's collection is one such.

The bone has always attracted attention because it is so elaborate. Oracle bones were never meant to be works of art, but this bone is exquisitely carved and inlaid with turquoise. The back of an oracle bone is unadorned, but the back of this bone is decorated with geometric, stylized animal forms, a characteristic of the art of the time. The inscription, also once inlaid with turquoise, reads:

"During the period of offering of the *Hsieh* ritual on the *hsin-yu* day of the eleventh month of the third year of the king's reign, the king hunted on the slopes of Mount Chi. He caught a very large and ferocious tiger."

During the preparation of a new display case in which it was to be featured, Mrs. Barbara Stephen, Associate Curator of the Far Eastern Department, suggested that perhaps as it recorded the capture of a tiger, the bone might conceivably be from the tiger itself. There are similar trophies in other collections. There are bones from deer and rhinoceros inscribed with a record of their capture. There is even a human skull recording the sacrifice of the chief of an enemy tribe, but there is no other known tiger bone.

The bone was taken to the Department of Vertebrate Palaeontology, where Mr. F. D. Ross identified it as the humerus of the right forelimb of *Felis tigris*. Dr. C. S. Churcher, the world-renowned expert on the sabre-tooth tiger, said that the Museum's bone, which measures 8½ inches in length and is 1¼ inches broad at its greatest width, is ⅙ of the total bone and ⅔ of its length. The bone was cut so that the shape would be pleasing and easily inscribed. He estimated that the tiger was an adult of considerable size, although not as great a beast as the king would have had people believe. That is not to belittle the king's triumph, because to kill a tiger, however small, with bronze-tipped arrows must have required great daring and courage.

Because of its great beauty and precisely dated inscription, some scholars have been dubious of the authenticity of this bone. Mr. Hsü Chin-hsiung, who came to Toronto from Taiwan to study the Museum's oracle bone collection, has devised a ritual calendar from other dated bones and shells. This bone fits exactly into the calendar for the reign of Ti-hsin, the last Shang king. The inscription and the date are thus beyond question. Now that it is known to have come from a tiger, the very tiger whose capture it records, there can be no doubt that the bone is unique, the only Shang tiger bone hunting trophy in existence.

Agnostus, *x 12.8,*
one of the oldest trilobites,
with only two body segments

ROM *photographs: Leighton Warren*

THE RISE AND FALL OF FOSSIL DYNASTIES

Dr. Madeleine A. Fritz,

Research Associate, Department of Invertebrate Palaeontology

History began when records of one kind or another have come to light and have been interpreted. Ancient Greece and Rome, and indeed many much older civilizations, have provided us with evidence by means of which the customs and manner of life of their time have been revealed. However, the oldest of these civilizations dates back only a few thousand years and, while they may seem old according to our standard of reckoning, they are but as yesterday when considered in the light of earth history. Long before man appeared on the earth, race after race of primitive creatures inhabited the prehistoric seas and lands in an orderly succession. These races handed down no inscribed records to posterity but their remains in the form of fossils serve as documents that tell us something of the history of the age in which they lived.

The study of fossils has provided us with many excellent examples of the rise to dominance of certain animal groups, followed

Sphaeroceras, *x 5*—
an involute shell with external ribbing

by their gradual decline and in certain cases, by their ultimate extinction. Again and again we may note the emergence of some group from obscure beginnings. We may trace it through a period of great expansion, and then note for it a slow decline, or sudden and climatic disappearance.

The earth is very old—some four to five billion years, according to recent estimates. The oldest recognizable fossils have been found in rocks estimated to be nearly three billion years old. This life is very primitive, consisting merely of unicellular organisms, some of which have been identified as algae. Examples of this early life are very rare, but since specimens have been recovered from several widely separated areas throughout the world, it seems that these primitive organisms may have been widely distributed.

It is not, however, until the Cambrian Period only 600 million years ago that well-preserved fossils, without a backbone, are found in rocks of sea-made origin. Some of these fossils bear a resemblance to shellfish we know today.

The *trilobites* made their appearance at this time. Probably no invertebrate fossils have caught the popular imagination more than this group. There is something about a trilobite that invites inquiry: the three-lobed shell, the head with prominent eyes, the well preserved segmented body, all suggest a creature that once lived and moved about much as do their remote descendants the lobsters and crabs of today. Because of their relatively high organization, their presence in rocks as old as the Cambrian is surprising. Continued research may uncover transitional forms between unicellular organisms and the highly organized trilobites.

Rhyticeras, *a nautiloid, forerunner of the ammonite race, resembles a ram's horn. x 3/5*

As might be expected, the earliest trilobites were of the simplest kind, with unornamented shells, more primitive visual organs, and some with relatively few body segments. However, as time went on, and more and more highly developed types arose, living conditions in the seas were not as favourable for them as formerly. Changes in the physical environment, together with the appearance of predators in the form of fish-like creatures with backbones, made life difficult for a group that had become so closely adjusted to its surroundings.

What happened? Probably a population explosion followed which produced shells of many bizarre shapes often covered with spines, dagger-like processes, warty growths, nodes and other exoskeletal outgrowths. This response to the changing environment was prophetic of the trilobites' downfall and soon, after 400 million years of their known existence, they passed from the scene leaving nothing behind but their buried remains as reminders of their former greatness.

Another invertebrate group which experienced much the same fate as the trilobites was the *ammonites.* Thousands of years ago the peoples of Egypt worshipped a god called Ammon. They thought he was a man who often came to earth in the form of a ram with closely twisted horns. In the days when fossils were first studied coiled shells resembling rams' horns were found in profusion in certain rocks and they were called Ammon's stones or ammonites.

These interesting, highly voracious, chambered mollusks, related to the Chambered Nautilus of today, flourished in tremendous

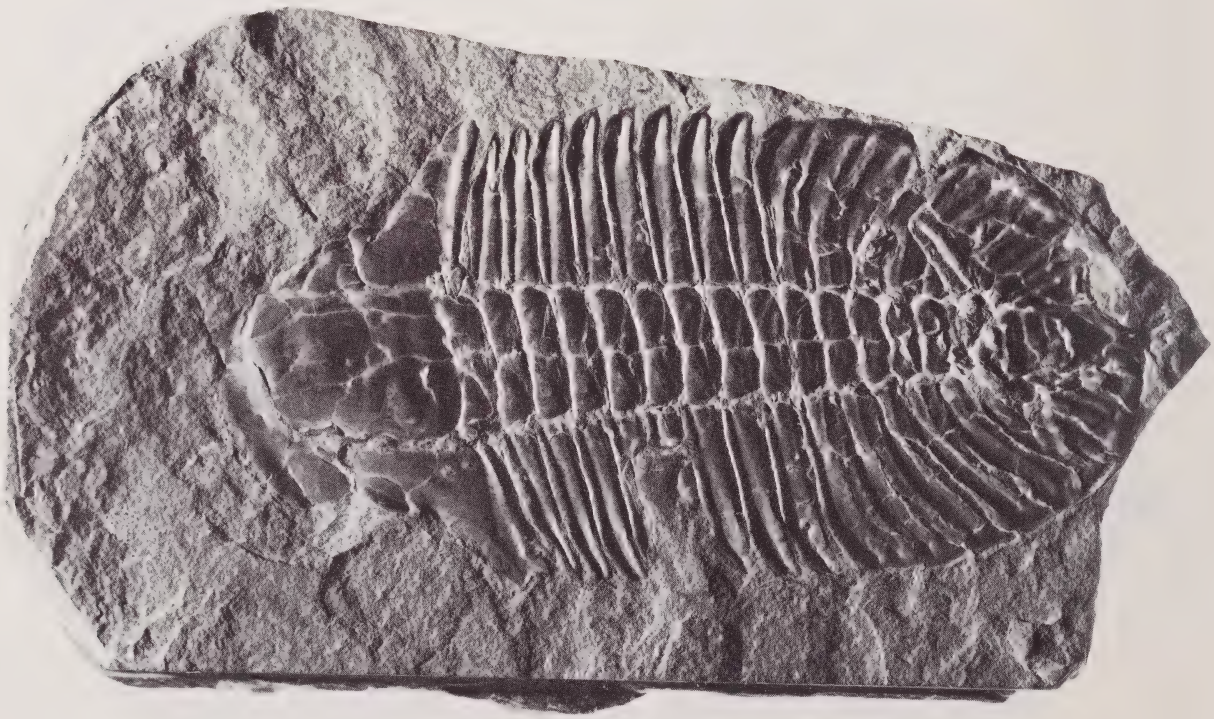
Haplopleuroceras, *x 1—loosely coiled shell*

Hildoceras, *a common ammonite from the Jurassic of England, named for St. Hilda*

numbers at a time in geological history much later than the trilobites. They dominated the seas during the age of dinosaurs 200 to 500 million years ago. At their peak their structure became more and more complex, manifested externally in a great variety of elaborately ornamented shells. There were coarsely ribbed shells with spines and nodes, large shells the size of cart-wheels, small shells the size of coins, spirally twisted shells, loosely coiled shells, and straight shells. Accompanying this diversification a crinkling and puckering along the edges of the septal partitions, which separated the chambers, took place. These intricate "sutural" patterns, which varied from genus to genus and from species to species, was yet another expression of specialization within the group.

What did all this variation mean? What was the significance of all this strange morphological change? What was Nature doing? We may never be able to answer these questions. However, it is worthy of note that these shellfish, which experienced such a display of "wantonness," slowly declined; their vigour spent, they eventually disappeared forever. Their buried remains, however, serve to document the age in which they lived. Their great numbers, their world-wide distribution, their excellent preservation, and the fact that the various populations changed rapidly from time to time, make them one of the best known stratigraphic time markers in geological history. They serve as a clock to tell the time at which each lived.

Many other extinct fossil groups displayed the same pattern during their life history as the trilobites and ammonites. For instance, the dinosaurs, that wondrous and diversified class of reptiles that dominated the vertebrate world



Pseudogygites, *x 1, a common trilobite at the height of their development*

in great profusion and variety 200 to 500 million years ago yielded at last to Nature's call and were no more.

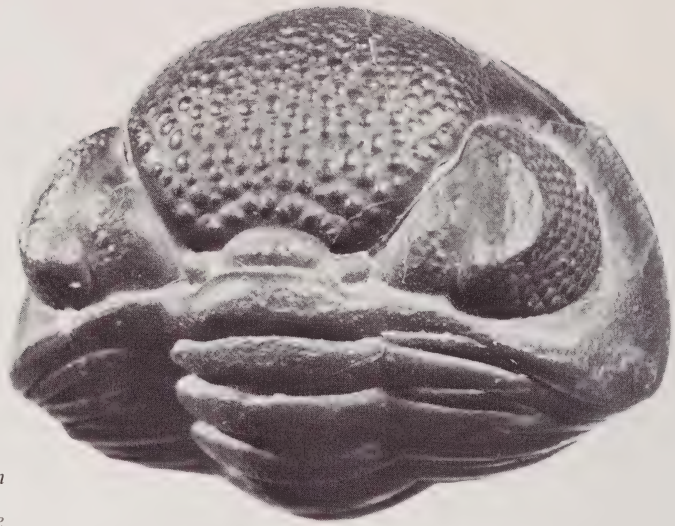
After considering the fate of a few of these great "rulers" of creation, we may consider the nature of this evolutionary process.

We have repeatedly discovered in times past the emergence of a group from humble origin; we may trace it through a period of great expansion; and then note for it a slow decline to a sudden and climactic disappearance. Some groups may have given rise to more efficient forms that superseded their predecessors as leaders in the pageant of life. Gradually, we are discovering some of the reasons for success or failure in this fight for survival. Beyond question, man can profit from these past experiences if he uses the intellectual and moral resources available to him.

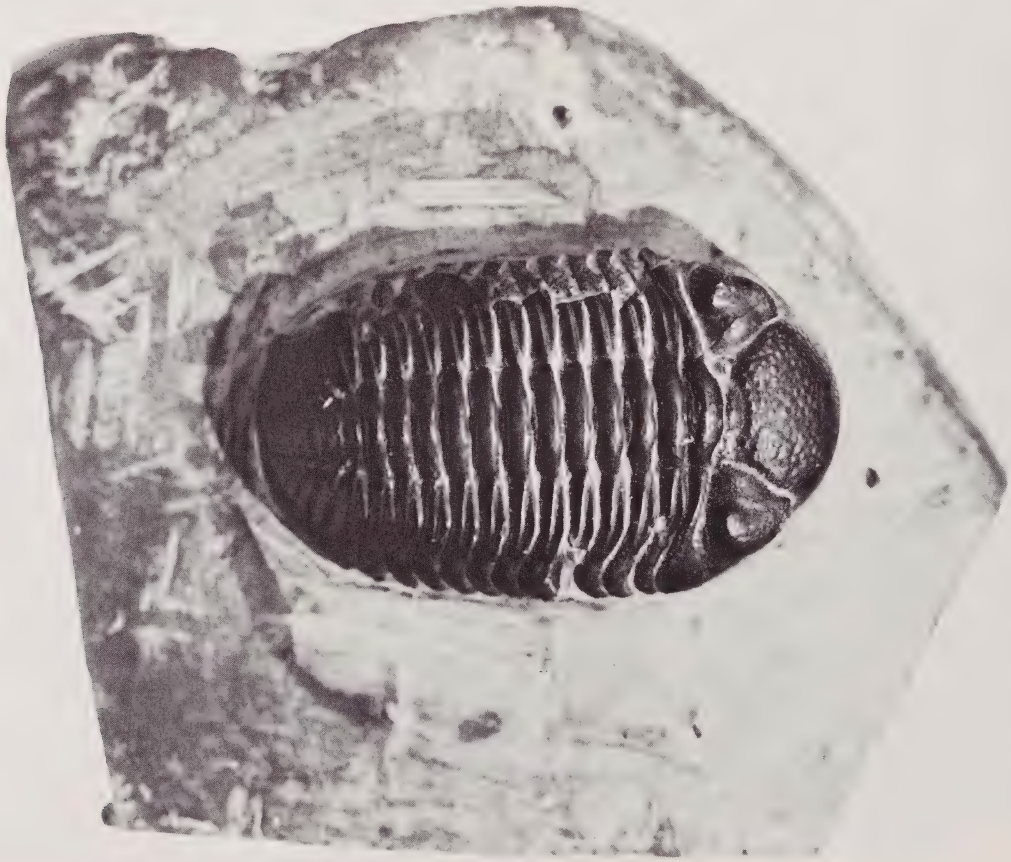
That man is a part of Nature, there is little

Oxynoticeras *(x 4); coiled form with complex suture, from the peak of the age of ammonites*

Baculites, *x 1, a straight form with complicated suture; among the last of the tribe*



Phacops (*whole specimen x 3-2/5; head x 4-3/4) a highly specialized form with prominent faceted eye, forerunner of the extinction of the race*



doubt. That he may be more than an animal is a matter of definition; but that he is part of the animal world is certain. Like other animals man is a product of the evolutionary forces operating on our planet. We may be the latest product of these creative forces but we have no reason to believe that we are the last achievement. Nor should we infer that man will continue his progress to even higher levels. Evolution only guarantees change!

As far as we know, man is the only member of the animal world capable of directing to a degree his own evolutionary destiny, but he may not use that power wisely. Security for most of the lower animals lies in their specialization of structure and habit to a particular environment. Man, on the other hand, is a specialist in adjustability of structure and habit to a variety of environments. He can live in the frigid polar regions, in the tangled Amazonian jungle, beneath the surface of the oceans or high in the ethereal heights. In other words he can control his surroundings rather than modify his organs, though it is a well known fact that his physical form is undergoing gradual change.

If tendencies developing in man are controlled and encouraged there is good reason to expect his long existence. With emphasis on intelligence and free will man may achieve that which the temporarily triumphant fossil dynasties failed to accomplish. So we may turn from the exciting vista of geological history to the enticing prospect of the geological future with optimism and hope.

Madeleine A. Fritz has been associated with the ROM for over three decades, during which period she has served as Assistant and Associate Director of the Museum of Palaeontology and later as Curator of Invertebrate Palaeontology. In 1956 she became Professor of Palaeontology at the University of Toronto. Now Professor Emeritus in the U. of T. Department of Geology, she is Research Associate in the ROM Department of Invertebrate Palaeontology. Dr. Fritz is a Fellow of the Royal Society of Canada, the second woman in Canada to be so honoured.

Recent Publications

THE BATTLE FOR JAMES BAY
by W. A. Kenyon and J. R. Turnbull
Macmillan of Canada; 132 pages, map and illustrations; $7.95.

Early in the March of 1686, before winter was even over, the Chevalier de Troyes gathered together a force of 100 men on Montreal Island and set off to attack three English forts on James Bay—1500 miles away. His mission was a notable success. The forts were destroyed, he lost only three men and was back in Quebec by the fall.

Historian J. R. Turnbull, in the first part of the book, concisely, if sometimes confusingly, sets the scene and the causes that led to the action. In the latter part, ROM archaeologist W. A. Kenyon entertainingly describes recent investigations at the site of one of the forts.

But the real author of the story is the Chevalier de Troyes whose journal of the expedition has been translated into English for the first time.

The journey, via the Ottawa and Abitibi rivers, was one of frightful hardship and endurance, yet de Troyes reports it all with singular, almost casual simplicity. He can even touch his narrative with a nice, dry wit. After describing a fierce bush fire and mentioning one or two odd coincidences concerning fires, he quietly remarks, "I must therefore warn the reader to be extremely careful of fire if he is reading this passage by candlelight." There are slightly poetic flights, too. He writes of "the music of the muskets" and "the sound of my cannon . . . taking the bass notes."

The story is rounded out with some short reports by other participants, both French and English. Understandably the English versions are somewhat defensive.

CHINESE JADE by Doris Dohrenwend
Royal Ontario Museum, 136 pages, hard cover; 90 pages of illustrations, 2 colour plates, comprehensive bibliography. $8.95.

The Chinese have prized jade over all substances including gold from late Neolithic times (?3000 to 1550 B.C.), when the jade axes of village chieftains were as precious and valuable as the crown jewels of China.

ROM jades number over 1000 pieces. More than half are of major qualitative or historical interest. The selection of examples for publication at this time is based on both kinds, with historical emphasis. *Chinese Jade* is not only a catalogue of major pieces from the ROM collection, but a highly readable, illustrated introduction to the study of jade in all its forms, including weapons and tools, archaic jades, ritual jades, personal ornaments and sculpture.

Among other things, the book deals with some of the problems in classifying jade. Archaeology, for example, is not always helpful in gleaning jade history, in that this mineral, enduring, portable and precious, is quite likely to be discovered far from its point of manufacture, not to mention its natural origin.

Then, too, true jade is difficult to distinguish from other polished hardstones. Colour is not a definite indication either, since there is an infinitely varied range of colours and states, including grey, near-black, russet, tan, "chicken-bone white" as well as translucent greens.

MUSICAL INSTRUMENTS IN THE ROYAL ONTARIO MUSEUM; Ladislav Cselenyi, Assistant Curator, European Department; a guide to the 300-year development of musical instruments, chiefly from the R. S. Williams collection, as displayed in the ROM; 96 pages, illustrated, $3.95.

THE WILLIAM EBY POTTERY, CONESTOGO, ONTARIO, 1855-1907; Art and Archaeology Occasional Paper 25; D. B. Webster, Curator, Canadiana; 54 pages, illustrated; $3.50.

Life Sciences Occasional Papers: No. 18 *The Trepostomatous Bryozoan Stigmatella catenulata diversa Parks and Dyer (1922), a synonym for Mesotrypa diversa (Parks and Dyer)*; Madeleine A. Fritz, Research Associate, Invertebrate Palaeontology; 8 pages, 50¢. No. 19 *The Larva and Pupa of the Caddisfly Genus Setodes in North America (Trichoptera: Leptoceridae)*; Dorothy Merrill and G. B. Wiggins, Curator, Entomology; 12 pages, 50¢.

Just reprinted: *The Round Lake Ojibwa*; Art and Archaeology Occasional Paper 5; E. S. Rogers, Curator, Dept. of Ethnology; $4.00.

All publications listed above are available at the ROM Book and Gift Shop.

PALACE IN A TEPE

Life returns to a Persian chateau

The asphalt highways connecting major cities in Iran do not always follow ancient routes. Many important settlements of the Medieval Period (7th-18th century A.D.) have been by-passed and forgotten. Today dirt roads, visible only to the experienced eye of the local Iranian driver, connect these sites to the more accessible points along the highways. Once off the highway, what would ordinarily be an hour's trip turns into half-a-day's trek. But this is the only way one can see and study the Islamic architecture of Iran.

Before the modern period travel was arduous and took infinitely more time, but the traveller was assured of a stopping place at dusk each day. Throughout the world of Islam, from Spain to India, caravanserays grew up along the highways at intervals of approximately a day's journey by horse, to provide shelter for both

Blind arcades of the facade; shāhneshīn *(balcony) in upper left. Photographs by the author.*

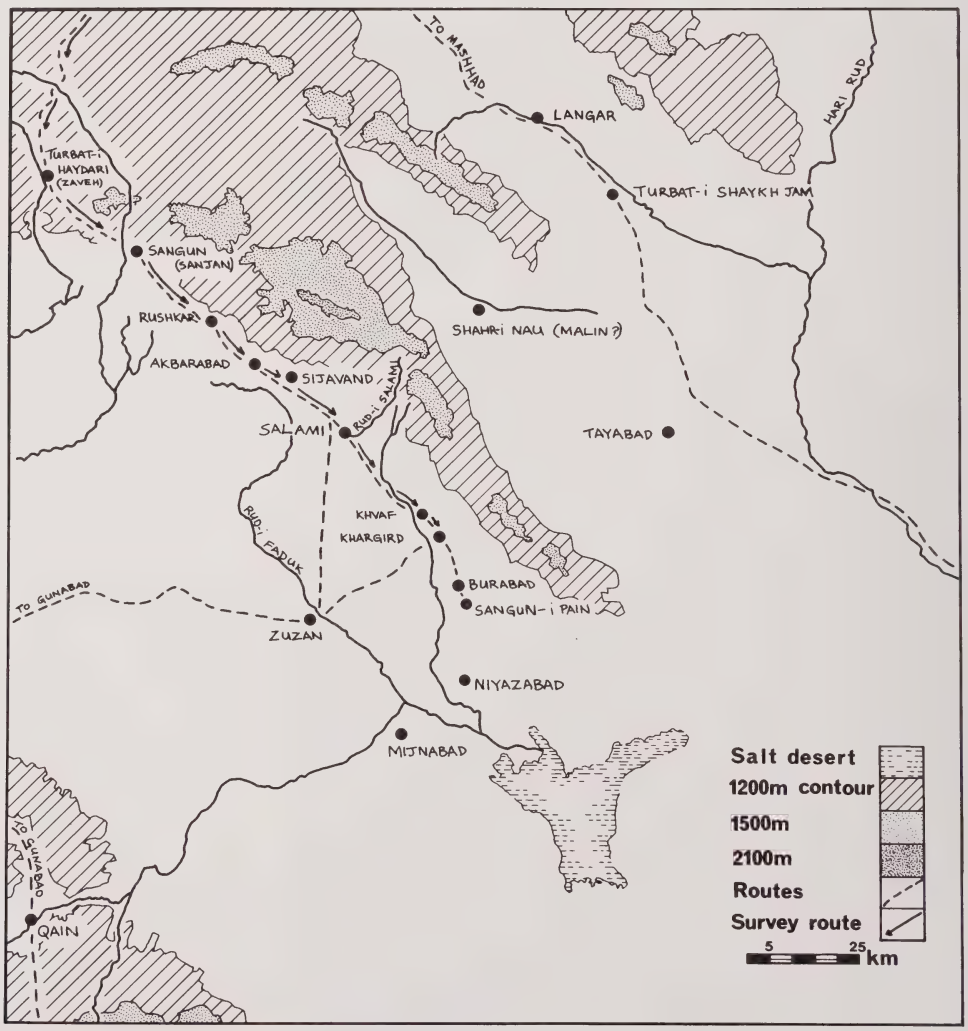
L. Golombek

Assistant Curator,
West Asian Department

traveller and beast. The route which I had laid out through the province of Khvaf in north-eastern Iran boasted no such amenities. Fortunately, friends were able to arrange contact with the owner of a large "guest house" in the village of Salami.

From Mashhad westward through the great dust basin of Khurasan an excellent road heads toward the mountains to the south. The landscape suddenly rises into lush green peaks as the road begins to wind through the Kuh-i Surkh mountains and the cool fresh air of Turbat-i Haydari. On the descent from the mountains the landscape once again turns brown.

At Sangun, once a major stopping point along the route between Herat and points west, a chat with the villagers at the tea-house did not lead us to any medieval remains in the area. Had we pursued the question we might have found the shrine of the famous mystic, the "Shah" of Sanjan (modern Sangun), which the historians say is located in this town. The cult of the "saint" goes back to the 12th century.



At the next town, Rushkar, we found the ruins of an 11th-12th century *madrasa* or *khanaqah* (a cross between a monastery and a hostel). We were not the first Westerners to study it, they told us. Someone else had been by recently.[1] How long ago? About forty-five years! But proud as the villagers were of their own vestige of the past, they urged me not to miss the wonders of Salami.

The next stop brought us to an enormous ruin-field, where remains of brick vaults poked their heads up through the sand. Akbarabad is the modern name of this lost city, but its true identity is buried along with its architecture. Even a study of the medieval texts describing the province did not reveal its original name.

The villagers of Akbarabad, as at Rushkar, chanted the praise of Salami.

And Salami itself? As far as one could see, a pine forest stretched out in all directions. At its entrance, one's eye followed the neatly ordered paths of the formal Persian garden to a point somewhere at its centre. There in the distance, framed by boughs of pine, was an

Facade of the palace at Salami, seen from the gardens

Map of the Khvaf Province, showing route of the survey

enormous structure, hardly what one imagines a "guest house" to be, and more like a chateau on the banks of the Loire.

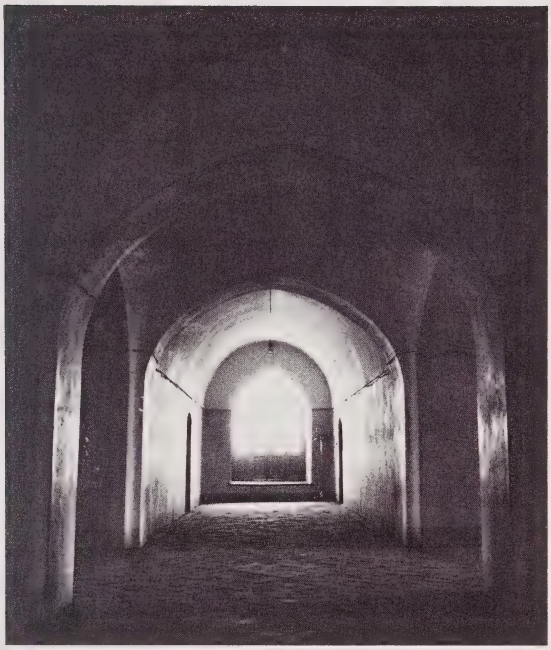
This was the palace of Salami. Its three storeys soar to a stupendous height. Along the facade is marshalled a double blind-arcade. The central arch of the second storey penetrates deeply into the building, forming a balcony, or *shāhneshīn*, where the prince in medieval times would make his public appearances.

In front of the opposite side of the palace extends a high platform, on which lies a reflecting pool, catching the image of the balcony above it and neatly framing the arch of the niche as if it were a scene from a Persian miniature painting.

The rest of the wall was almost blank, with two small windows flanking the balcony on the second floor and five apertures along the first. I surmised that the interior on this side of the building must be much drearier than the other.

The first floor was given over to servants' quarters, storerooms and service rooms, and I was unfortunately not invited to browse through. The second storey was reached from a ramp located near the side entrance of the palace. The floor was divided into four quarters by two long intersecting halls. The balconies visible on the outside of the palace now appeared to be extensions of the hall which ran through the width of the building. Doors opened off these corridors into long, dimly lit rooms, where the keeper of the palace and his family slept. Again the possibilities for studying the architecture of the palace were limited by the modesty of my hosts. The room which we did visit had two niches in the outer walls. The sides of these arched niches were askew and

The palace from the rear, with platform in foreground



Intersection of the two axial halls on the second floor

One of the corner rooms on the second floor with two skewed windows

terminated in openings in the outer wall of the palace. Thus the sunlight entered the room quite indirectly, which must have been an effective way of keeping the coolness in. Here one could measure the thickness of the walls—some four metres in all!

Judging from the openings in the other walls of the palace, it seemed that there were four such rooms on this side of the building, two reached from the inner corridor and two reached from doors on the central balcony. The corner rooms were lit by windows both in the facade and in the narrow sides of the palace. The paucity of windows on the opposite side of the corridor suggested that the rooms flanking the balcony here were long and extended the full distance between the balcony and the corners of the building.

The third storey was reserved for the guests, with an elegant reception hall over the centre, a spacious dining room on one side, and sleeping quarters on the other. It became increasingly clear that this was no Hollywood recreation of a medieval scene, but in fact the skeleton of an actual vestige of the past. Despite the obvious liberties taken by the architect, the ancient design was totally visible.

The answer came shortly after dinner. On the wall of the reception room hung several photographs. One showed the owner of the palace (who was at this time in Tehran) mounted on his prize stallion. The others revealed an enormous mound of earth, its steep sides sculpted by erosion gulleys, with openings regularly spaced along its base.

What had existed on this spot some twenty-five years ago must have looked like any one of the hundreds of artificial mounds that are scattered throughout the Near East. But this was apparently not a stratified mound built up over centuries, layer upon layer, each one representing the remains of a succeeding generation. This was actually a single structure, not commonly found in Iran proper, but a familiar sight across the border to the north in Turkmenistan. Such palaces, called "kushks" (kiosks), were built in the countryside from the 9th to 12th centuries and served as manor houses on the estates of country gentlemen.[2]

The first such palaces had a fortified look and certainly were intended to provide some protection for the villagers in case of attack. Later, these chateaux became more luxurious, more elegant in conception, with elaborate facades and beautifully decorated entrance portals.

It is difficult to know just how much of the reconstructed palace at Salami is original. It seems that the walls were found almost entirely intact up to the second storey. The third floor was apparently added as an extra flourish.

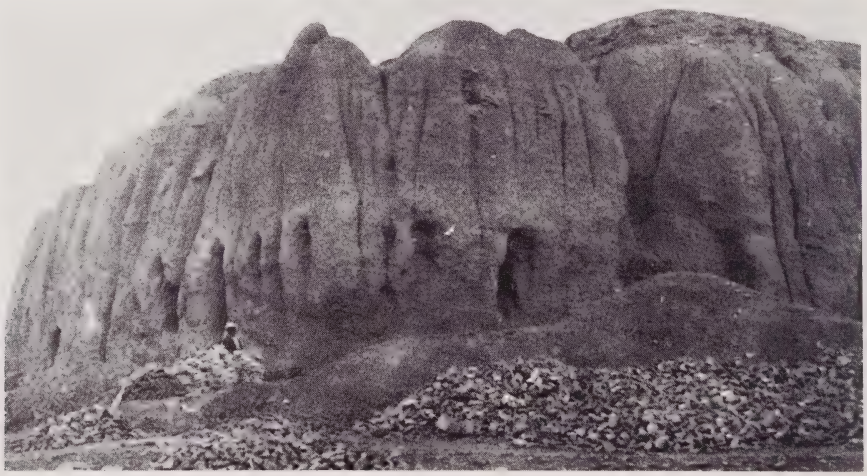
How old is the original structure? Similar palaces were built in Central Asia between the 9th-12th centuries; the brick size points to an early date, and the remnants of decoration discovered in the excavations point to the 12th century. One of the original unfired bricks which I was shown measured some 40 cm. on a side. Most monuments of medieval date in Iran use bricks of half that size. The larger brick was more common in pre-Islamic architecture and during the first centuries of Islam.

These mammoth brick walls were at least in part concealed behind a lavish tile facing, remnants of which have been preserved. A section of carved unglazed terracotta with hour-glass designs must have come from a large geometric pattern typical of 12th century decoration. A fragment of carved terracotta glazed in a muted turquoise blue showing part of a trefoil flower came from a surface decorated with arabesque and floral ornament, also typical of the 12th century. A large eight-pointed star in the same technique belonged to a complex geometric pattern.

Still another technique is represented in the decorative fragments. In the 13th century advanced technology permitted the ceramicist to circumvent the tedious operation of building up a large design by fitting together many tiles of different shapes and colours. The mosaic effect could be imitated by painting in different colours on single, uniformly shaped tiles, which could then be fitted together to complete a pattern. It is the difference between tiling a wall with individual tesserae set in plaster and the less expensive method of putting up a panel embossed with a tile pattern. These painted "majolica" tiles of the 13th century imitate the earlier, more expensive method, also found at Salami.

None of these fragments are still *in situ*. Perhaps they belonged to the revetments of an elaborate entrance portal of one of the side entrances. Traces of the original stucco decoration on one of these hint at its original splendour. The lower incised panel has a design based on intersecting octagons. The compartments are filled with a leaf-like ornament. The upper panel had in its centre a large eight-petalled rosette, also filled with smaller ornaments. These revetments probably belong to

"Before"—photograph of the mound, taken 25 years ago



the 11th-12th centuries, and parallels can be found in Central Asian architecture.

As for the age of the palace at Salami, one can safely say on the basis of such comparisons that it is at least 800 years old if not more. Of course, its decoration may have been "updated" several times.

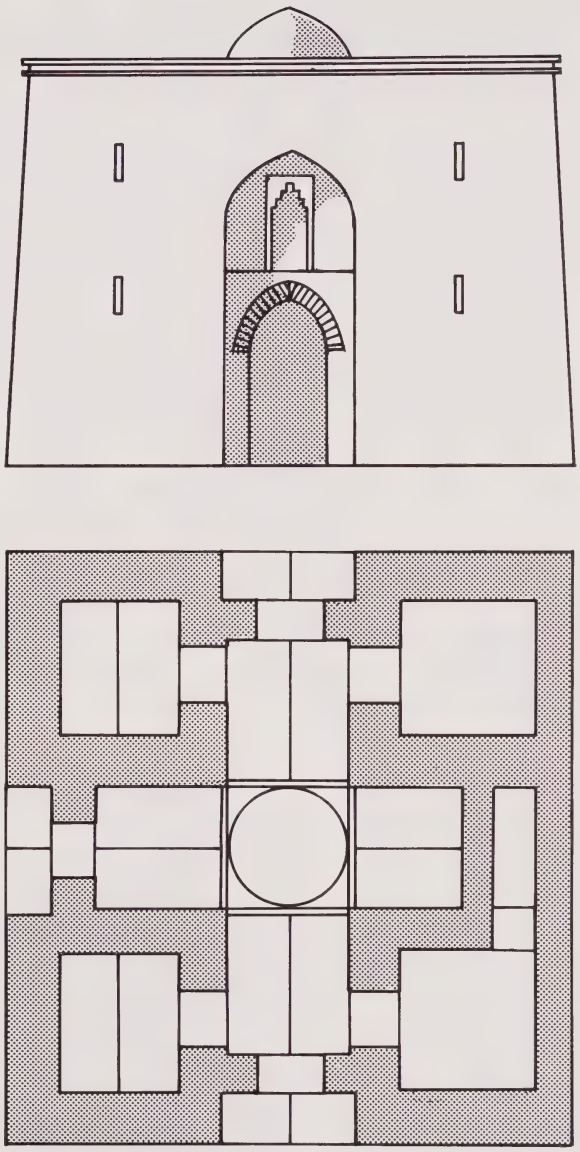
But perhaps the most puzzling period of "renovation" is the most recent one. Why had the owner of the mound taken upon himself such a grandiose project? What sort of dream or fantasy drove him to excavate this enormous mound and to rebuild it as a house in which he himself was to spend very little time? His own residence, which I visited another time, was in a beautiful section of Tehran, in the midst of a garden of prize roses.

I was told that the gentleman himself had not known what lay concealed in the heart of this mound when he first put his spade to it. The mound had been purchased along with the village at its base. When he began to probe it, he found it riddled with a maze of tunnels and then concluded it was an entire palace preserved over the centuries. At great cost, an architect was hired to excavate it and restore it to its original state as much as was possible.

In the countryside rumours run somewhat differently. One itinerant engineer told us that it was from the famous mound of Salami that its owner derived all his wealth. According to the owner, nothing of value was discovered, and this is no doubt the truth of the matter.

As I pondered the mystery of Salami, the proud equestrian portrait of the owner hanging in the reception hall flashed through my mind. In restoring the castle of Salami, had he seen himself as its former master, guarding and ruling the countryside from the depths of his medieval domain? Had this vision made the expense worthwhile?

What was Salami in its medieval prime?[3] In the 10th century, the region of Khvaf, which lay between the mountains of Khurasan and those of Qain to the south, was a much-travelled corridor. The even terrain of the Khvaf lowlands linked the great cities of south-western Iran across the desert with the main arteries of trade in the East. But the cities



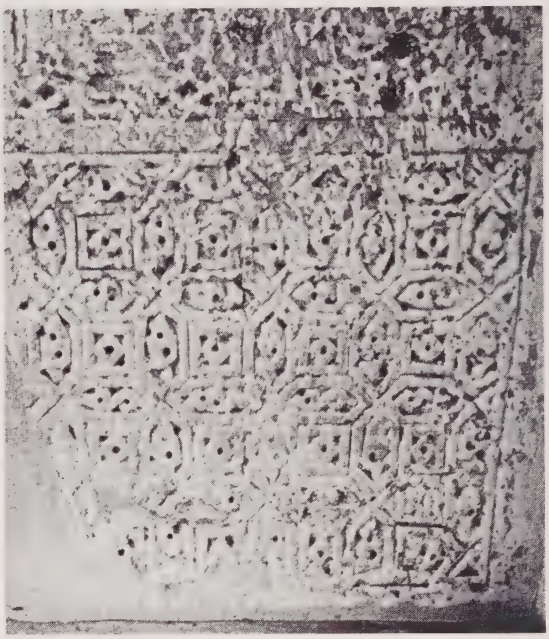
Example of a typical Central Asian chateau (after Pugachenkova)

along this route were Malin (Shahr-i Nau?), Jaymand (whereabouts unknown), Sangun (Sanjan), and Qain. So Salami did not lie along this route. The geographers tell us that if you want to go to Salami (Salumak), you must deliberately turn off at Sangun and journey eastward again for two days. From here you then turned southward to the town of Zuzan and from this point to Qain and points west.

Salami was nevertheless the most important town in the region. Mention is made of the cultivation of raisins and pomegranates. A look at the geography of the region does suggest natural advantages for agriculture. Rising in the mountains just to the north is the Salami River (Rud-i Salami). The waters are controlled by a dam and conserved in a reservoir in the village. Although the whole region is one of arid climate and saline soil, the area around Salami is particularly favoured.

Salami benefited from not only the use of these convenient waters. We may assume that

Detail of the lower section of carved stucco panel in the side entrance



Fragments of architectural decoration from the original palace: first row: glazed and carved terracotta; second row: unglazed carved terracotta; third row: original brick; painted and incised majolica tiles

General view of the Madrasa at Khargird (c. *1432* A.D.)

it also controlled their distribution and use by nearby settlements. The chateaux of Central Asia were often built at points which controlled the source of water in a region. So in addition to its own agricultural production, Salami's chief "commodity" was probably water itself.

In the 11th-12th century, the palace or manor of Salami must have commanded a prosperous and rich countryside. It is perhaps not a coincidence that within these very centuries the major public monuments found in the province today were erected. Each town along the route from Turbat-i Haydari to Sangun-i Pain and Zuzan boasted a new mosque, a new shrine, a new college.

No doubt this period of expansion was curtailed to some extent by the devastating effects of the Mongol conquest, which laid waste so many of the great cities of Iran. But the successors of Ghengiz Khan identified more and more with the culture and the problems of the land they had conquered, and with the reign of Ghazan Khan (1295-1304 A.D.) a new era began. Fiscal reform and re-development inspired the revival of many depressed areas.

In 1337 A.D. a severe earthquake shook the entire region of Khvaf, causing the deaths of about 41,000 persons in the towns between Zuzan and Dughabad. Little permanent damage seems to have occurred, however. Perhaps the irrigation works required some repair, for toward the end of the 14th century a new dam was built across the river above Salami. I was told that traces of this dam could still be seen.

The 14th century saw the Khvaf region renewed in vigour, but now controlled by a handful of individuals. Their strongholds were scattered throughout the countryside—at Zuzan, Niyazabad, Burabad, Mayizhnabad (Mijnabad?), and Mishkan (halfway between Niyazabad and Zuzan). This powerful local faction opposed the authority of the central government, which at that time was the Mongol court at Tabriz in northwestern Iran.

Eventually yielding, they nevertheless remained strong and active. In the 15th century

they supplied a series of powerful ministers to the Timurid court at Herat. A local historian of this period calls the province the "birthplace of kings, *ulama* [clergy], and viziers." One remarkable vizier from Khvaf held office for some forty years, virtually dominating the government of Shah Rukh, the son of Tamerlane. It was he who borrowed the court architect for the construction of a magnificent theological college (*madrasa*) in his native town of Khargird, east of Salami. The college is an unexpected gem in the midst of a desert, a monument more suited to an urban setting than a quiet hamlet in the country. Perhaps local pride inspired this generous move.

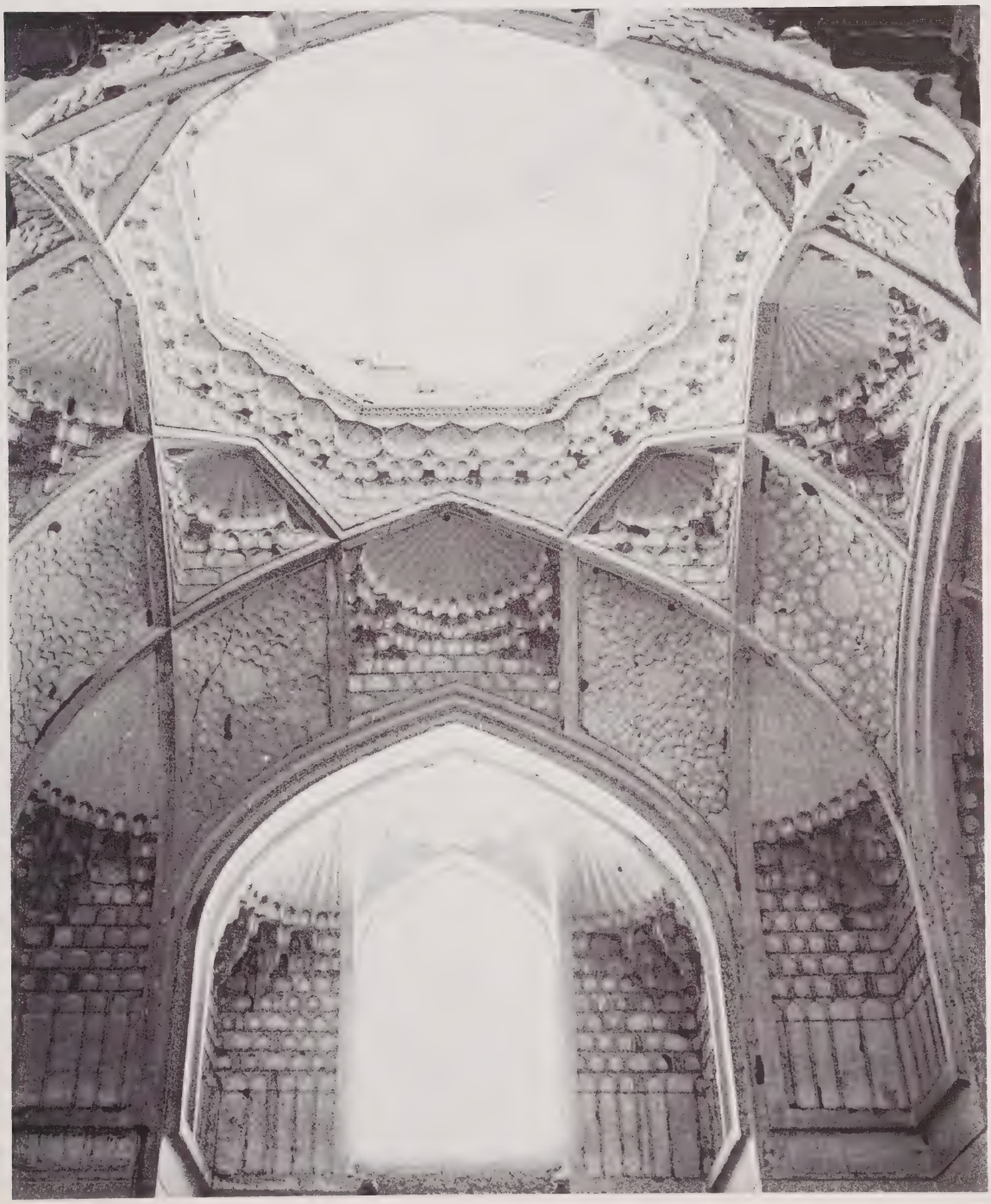
It is difficult for an outsider, even for an Iranian from another quarter of the country, to appreciate a region like Khvaf. It is so obviously not one which nature had favoured for human habitation. But the inhabitants show a remarkable pride in their land and in its past. In the town of Khvaf there are still people who trace their lineage back to the family of the vizier of Shah Rukh, and they can show you the tombs of his sons in the town's ancient cemetery or the carved wooden *minbar* (pulpit) donated by one of them to the local mosque. Local pride is a long-standing trait in the Khvaf region. There is a story told about a prominent visitor to the area in the 12th century, Hasan-i Sabbah, founder of the notorious Order of the Assassins. Stopping in the town of Zuzan he remarked upon the sparsity of trees. His gracious host replied: "Our men are our trees."

Notes

1. Some of the sites visited in this survey were reported by E. Diez, in *Churasanische Baudenkmäler* (Berlin, 1918), pp. 29, 72-76, 83-84. For a general discussion of Persian Islamic Architecture see O. Grabar and D. Hill, *Islamic Architecture and Its Decoration* (London, 1964).
2. For numerous examples and other points of comparison see G. A. Pugachenkova, *Puti Razvitiia Arkhitektury Iuzhnogo Turkmenistana Pory Rabovladeniia i Feodalizma* (Courses of Development of the Architecture of South Turkmenistan in the Time of Slave-owning and Feudalism), *Trudy Iuzhno-Turkmenistanskoĭ arkheologicheskoĭ kompleksnoĭ ekspeditsii*, VI (Moscow, 1958).
3. The Khvaf region is described by the major Arab geographers of the 10th century (Istakhri, Ibn Hawqal, Muqaddasi), and by later Persian sources (Mustawfi, Isfizari, Fasih al-Khvafi). See G. LeStrange, *The Lands of the Eastern Caliphate* (Cambridge, 1905; reprint 1966), pp. 352-363; also, W. B. Fisher, "Physical Geography" in *Cambridge History of Iran*, I (Cambridge, 1968), pp. 73-76.

Lisa Golombek's field of special interest is Timurid architecture. She was a guest at the "palace in a tepe" during field research in Iran, Afghanistan and Soviet Central Asia sponsored by a Foreign Area (formerly Ford) Fellowship. Dr. Golombek was born in New York and received her B.A. from Barnard College in 1962 and her Ph.D. from the University of Michigan in 1968. She came to the ROM in 1967, and is presently Assistant Curator, West Asian Department, and Assistant Professor, Department of Islamic Studies, University of Toronto.

Ribbed vaulting in the Madrasa at Khargird



The Growing Collections

From the recent dispersal in Paris of an old and well-known private collection, the Greek and Roman Department acquired two terracotta objects, a statuette of a comic actor in the guise of a club-clutching Heracles astride a fat pig (illustrated), and a small flask in the form of a fantastic beast. The objects were part of the late Dr. Fouquet's collection of terracottas from Graeco-Roman Egypt. Showing traces of the original painted decoration, the terracotta of Heracles is of good Greek style and careful technical execution—a valuable addition to our collection of terracottas from Ptolemaic and Roman Egypt. The piece was published in Professor Paul Perdrizet's catalogue *Les Terres Cuites Grecques d'Egypte de la Collection Fouquet* (1921), No. 436, pl. 87.

The other Fouquet piece belongs to the characteristic class of fine vessels in black ware of the "bucchero" type, crisply moulded and almost always of small dimensions, whose provenance—when known—is usually Memphis and whose date is Ptolemaic or early Roman. The small flask in the shape of a winged griffin with a dolphin's tail, with other examples of this class of pottery (a Bes-on-horseback and a Bes-head vase, a lamp in the form of a Negro head and several pilgrim bottles) is exhibited in the Roman Daily Life Gallery in the newly refurbished wall-case illustrating Ptolemaic and Roman pottery from Egypt.

As opportunity permits, efforts are being made to build up the collections of Transylvanian and Hungarian costume and textiles to complement the very rich Roumanian one that the Museum is fortunate to possess. The decorated sheepskin jacket shown here comes from the Bistriţa region of Transylvania, and dates from the early 20th century. It is really a woman's winter garment, but was also worn on Sundays and festive occasions during the summer. The embroidery is in multi-coloured silks with fine white and brown leather appliqué.

Two arrivals in Chinese and Japanese painting illustrate two aspects of change in the development of Far Eastern pictorial art. The Chinese hanging scroll of lotus by Chou Ch'üan (act. *c.* 1700) may be more immediately appealing. Its huge scale, over 8′ in height, and bombastic brushwork anticipate the free expression of more modern painting. Dated to 1727, the work is executed in ink alone on paper, but its splashings and washes offer a tonal range which lends it a strongly colouristic effect.

The Japanese hanging scroll (*kakemono*) "Seeking Plum-blossoms in the Snow," executed in ink and light colour in paper, has been dated to the first half of the 16th century. Its style is related to that of Koboku, a Zen monk active in Kamakura during the late Muromachi period. Boulders and slopes in the foreground recall the influence of Chinese professional painters, the Che school, known to Japanese since the later 15th century. The softer handling of its background firs and distant peaks anticipate the romanticism of a more purely Japanese style.

The West Asian Department has recently obtained an illustrated astrological treatise, the "Table of the Fixed Stars" by al-Sufi, dating from the second half of the 17th century, probably from Isfahan. Among the major constellations illustrated are *Navis*, the galley, and *Perseus*, clad in the garb of a Persian hero. From a group of 11 costume drawings of officials in the Ottoman court at Istanbul, mid-17th century, comes the Court Taster, an indispensable aide of the Sultan, whose life was often threatened by internal conspiracies to poison him.

The Museum is now world-famous for its collection of Indian painted and dyed cottons called chintzes, made for the European market in the 17th and 18th centuries, but until now has had only a meagre representation in the field of Indian chainstitch embroideries with similar designs and also made for the European market. By great good fortune the Museum has recently acquired four excellent examples of these important embroideries. All are exceptionally fine examples of chainstitch, worked with coloured silks on fine cotton. The most impressive pieces are two 18th century bedcovers called palampores; a detail of one is shown.
A beautiful overdress of about 1780 made of embroidered yardage in a richly coloured repeating floral pattern, and a panel of delicate floral sprays worked entirely with red silk, complete the group.

Ten species not previously represented have been added to the Mineralogy collections since May 1971. Of these, demesmaekerite was donated by Mr. William Pinch of Rochester, who also exchanged with us specimens of masuyite, marthozoite and studtite, all from the Republic of the Congo. Specimens of cafarsite from Italy and asbecasite from Switzerland were received by exchange from Dr. Stefan Graeser. Mr. Milt Stitt of Montreal presented a fine specimen of lemoynite from Mont St. Hilaire, Quebec. Four other minerals new to the collections are benstonite, paradamite, chkalovite and minyulite.

A beautiful natural octahedral crystal of diamond, weighing 11.75 carats, was given by the Anglo American Corporation of South Africa, and an enormous pyrite octahedron from Uganda, 6″ from point to point, was donated by Mr. Sam Amukun. An attractive vase with lid, carved in the People's Republic of China from grey fluorite, was given by Mr. David Lin.

On the home front, the Department collected some fine crystals of the new find of purple scapolite from near Gooderham, Ontario. A superb mimetite specimen from South West Africa (illustrated) and a magnificent example of prehnite crystals from Asbestos, Quebec were purchased. An apatite crystal 9″ in length and 2″ in diameter, and lying on a naturally-weathered surface of marble, is also an important acquisition.

New to the gem collection is a tiny box (40 x 33 x 16 mm) made entirely of precious opal. When opened, it reveals a small pedestal of high quality precious opal upon which rests a spectacular fiery black opal cabochon (16 x 11 mm), undoubtedly the most vivid opal in the entire collection. Other important gems are a 5.76-carat demantoid, fiery green and very lively, and a brilliant 45.15-carat kunzite, deep pink in colour.

Index 1970-1971

Articles and Authors, Vol. 3 no. 1—Vol. 4 no. 4

Allodi, Mary: **The Red River Artist**; vol. 3 no. 4:29

Bacso, Jean: **The Passing Hours**; vol. 3 no. 3:22

Baillie, James L. 1904-1970: T. M. Shortt; vol. 3 no. 3:38

Bare Bones of Evolution; vol. 4 no. 1:18

Barr, David: **Crayfish Hunt**; vol. 3 no. 3:14

Black, Mary: **Legends and Accounts of Weagamow Lake**; vol. 3 no. 3:4

Brett, K. B.: **Little Women, Little Men**; vol. 3 no. 1:5

Ceramiques de France: Ladislav Cselenyi; vol. 4 no. 3:4

Conserving the Kane Collection: Elizabeth Phillimore; vol. 3 no. 2:14

Crayfish Hunt: David Barr; vol. 3 no. 3:14

Cselenyi, Ladislav: **Ceramiques de France**; vol. 4 no. 3:4

Emery, Alan R.: **Sublimnos: Researchers go underwater**; vol. 4 no. 2:21

Excavations—Nuns Island: D. B. Webster; vol. 3 no. 1:28

Fenton, M. Brock: **Tropical Bats**; vol. 4 no. 2:29

Fossil Pollen and Our Changing Landscape and Climate: J. H. McAndrews; vol. 3 no. 2:30

Frogkind and Mankind: Helmuth Fuchs; vol. 3 no. 4:28

Frohberg Collection, The: J. A. Mandarino; vol. 4 no. 4:5

Fuchs, Helmuth: **Frogkind and Mankind**; vol. 3 no. 4:28

Fuchs, Helmuth: **Identification?**; vol. 4 no. 2:13

Great Saskatchewan Mouse Mine, The: L. S. Russell; vol. 3 no. 1:16

Growing Collections, The; vol. 3 no. 1:25; no. 2:43; no. 3:43; no. 4:33; vol. 4 no. 1:45; no. 2:37; no. 3:25; no. 4:38

Guenther, Mathias G.: **Kalahari Bushman in Transition**; vol. 4 no. 3:8

Guns for the Eskimos: J. Garth Taylor; vol. 3 no. 2:22

Hickl-Szabo, H. A.: **St. Catherine of Alexandria: Memorial to Gerard Brett**; vol. 3 no. 3:36

Identification?: Helmuth Fuchs; vol. 4 no. 2:13

Jigsaw in Jade: D. M. Pendergast; vol. 3 no. 2:38

Kalahari Bushman in Transition: Mathias G. Guenther; vol. 4 no. 3:8

Kawamura Bumpo: David Waterhouse; vol. 4 no. 4:18

Keeble, K. Corey: **Small Bronzes of the Renaissance**; vol. 4 no. 2:5

Kenyon, W. A.: **The Sands of Time**; vol. 4 no. 3:30

Lapis in the Midnight Sun: V. B. Meen; vol. 4 no. 1:36

Legends and Accounts of Weagamow Lake: Mary Black; vol. 3 no. 3:4

Levine, Louis: **Of Medes and Media**; vol. 3 no. 1:36

Little Women, Little Men: K. B. Brett; vol. 3 no. 1:5

Mandarino, J. A.: **The Frohberg Collection**; vol. 4 no. 4:5

McAndrews, J. H : **Fossil Pollen and Our Changing Landscape and Climate**; vol. 3 no. 2:30

McGowan, C.: **Sea Dragons of the Mesozoic**; vol. 4 no. 4:30

McLaughlin, Col. R. S.—a 100th birthday tribute; vol. 4 no. 4:28

Meen, V. B.: **Lapis in the Midnight Sun**; vol. 4 no. 1:36

New Guinea: Big Man Island: E. S. Rogers; vol. 3 no. 4:4

Of Medes and Media: Louis Levine; vol. 3 no. 1:36

Passing Hours, The: Jean Bacso; vol. 3 no. 3:22

Pendergast, D. M.: **Jigsaw in Jade**; vol. 3 no. 3:38

Pendergast, D. M.: **People on Pots**; vol. 4 no. 1:26

People on Pots: D. M. Pendergast; vol. 4 no. 1:26

Phillimore, Elizabeth: **Conserving the Kane Collection**; vol. 3 no. 3:14

Red River Artist, The: Mary Allodi; vol. 3 no. 4:29

Rogers, E. S.: **New Guinea: Big Man Island**; vol. 3 no. 4:4

Russell, L. S.: **The Great Saskatchewan Mouse Mine**; vol. 3 no. 1:16

Russell, L. S.: **Those Remarkable Dinosaurs**; vol. 4 no. 1:4

St. Catherine of Alexandria: Memorial to Gerard Brett: H. A. Hickl-Szabo; vol. 3 no. 3:36

Sands of Time, The: W. A. Kenyon; vol. 4 no. 3:30

Sea Dragons of the Mesozoic: C. McGowan; vol. 4 no. 4:30

Search for Early Man in Ontario, The; Peter Storck; vol. 4 no. 4:18

Second Millennium Surprises: T. C. Young Jr.; vol. 3 no. 3:6

Shortt, T. M.: **James L. Baillie 1904-1970**; vol. 3 no. 3:38

Small Bronzes of the Renaissance: K. Corey Keeble; vol. 4 no. 2:5

Stephen, Barbara: **Wheels for the Dragon**; vol. 3 no. 3:14

Storck, Peter: **The Search for Early Man in Ontario**; vol. 4 no. 4:18

Sublimnos: Researchers go underwater: A. R. Emery; vol. 4 no. 2:21

Taylor, J. Garth: **Guns for the Eskimos**; vol. 3 no. 2:22

Those Remarkable Dinosaurs: L. S. Russell; vol. 4 no. 1:4

Tropical Bats: Collecting in Guyana: M. Brock Fenton; vol. 4 no. 2:29

Tovell, Walter M.: **When the Earth Speaks**; vol. 4 no. 3:16

Waterhouse, David: **Kawamura Bumpo**; vol. 4 no. 4:18

Webster, D. B.: **Excavations—Nuns Island**; vol. 3 no. 1:28

Wheels for the Dragon: Barbara Stephen; vol. 3 no. 3:14

When the Earth Speaks: Walter M. Tovell; vol. 4 no. 3:16

Young, T. C. Jr.: **Second Millennium Surprises**; vol. 3 no. 3:6

The Royal Ontario Museum

MEMBERS OF THE BOARD
Mr. Noah Torno, M.B.E., Chairman
Mr. Roy Cole
Mr. J. H. Crang
Mrs. D. C. Early
The Honourable Leslie M. Frost, Q.C.
Mrs. A. J. Grout
Mrs. W. B. Harris
Mr. John E. Langdon
Mr. Richard G. Meech, Q.C.
Mr. Hugh Pryce-Jones
Mr. Stephen B. Roman
Mr. Clair Stewart
Mrs. Edgar Stone
Mr. D. C. Webster
Col. D. B. Weldon
Ex-officio Members
Mr. W. B. Harris, Chairman, Board of Governors, University of Toronto
Dr. J. H. Sword, Acting President, University of Toronto
Dr. Peter C. Swann, Director

STAFF
Dr. Peter C. Swann, Director
Mr. J. H. Harvey, Secretary-Treasurer
Mr. V. Roberts, Financial Admin.
Mrs. H. R. Downie, Programme Sec'y
Mr. W. H. Bayley, Museology Admin.
Mr. D. Young, Visitor Services Development
Miss E. Martin, Consultant

Art and Archaeology Departments
Office of Chief Archaeologist
Dr. A. D. Tushingham, Chief Archaeologist
Dr. W. Kenyon, Assoc. Curator
Dr. D. M. Pendergast, Assoc. Curator
Mr. K. C. Day, Assistant Curator
Mr. P. Storck, Assistant Curator
Mr. F. Pryor, Curatorial Asst.
Dr. S. Loten, Research Asst.
Mr. B. Penny, Research Asst.
Mr. S. Dewdney, Research Associate
Dr. M. Gough, Research Associate
Dr. P. D. Harrison, Research Associate
Mr. K. R. Macpherson, Research Assoc.
Dr. D. A. Nelson, Research Associate
Mr. J. R. Turnbull, Research Associate

Canadiana
Mr. D. B. Webster, Curator
Mrs. H. Ignatieff, Curatorial Asst.
Mrs. M. Allodi, Research Assistant
Miss J. Holmes, Research Assistant

Conservation
Mr. B. Leech, Assoc. Curator-in-Charge
Mrs. E. A. Phillimore, Conservator
Mr. J. Chalmers, Conservator
Mr. D. Dudley, Conservator
Mrs. C. Jack, Conservator
Mr. M. Burnham, Asst. Conservator
Prof. U. Franklin, Research Assoc.

Egyptian
Miss W. Needler, Curator Emeritus
Dr. N. B. Millet, Curator

Ethnology
Dr. E. S. Rogers, Curator
Dr. Helmuth Fuchs, Associate Curator
Dr. J. G. Taylor, Assistant Curator
Dr. C. A. Bishop, Research Assoc.
Dr. M. Black, Research Assoc.
Dr. W. P. Carstens, Research Assoc.
Dr. David Counts, Research Assoc.
Dr. Dorothy Counts, Research Assoc.
Dr. T. B. Hinton, Research Assoc.
Dr. T. A. Steegmann, Research Assoc.
Dr. J. Vastokas, Research Assoc.

European
Mr. H. Hickl-Szabo, Curator
Mrs. J. Bacso, Assistant Curator
Mr. L. Cselenyi, Assistant Curator
Mr. K. C. Keeble, Curatorial Asst.

Far Eastern
Dr. Hsio-Yen Shih, Curator
Mrs. B. Stephen, Associate Curator
Miss D. Dohrenwend, Curatorial Asst.
Mrs. P. Proctor, Curatorial Asst.
Miss B. Kingston, Librarian
Dr. D. Waterhouse, Research Assoc.

Greek and Roman
Mrs. N. Leipen, Curator
Miss A. Harle, Assistant Curator
Dr. J. W. Hayes, Assistant Curator
Prof. J. W. Graham, Research Assoc.
Prof. J. Shaw, Research Assoc.
Dr. J. S. Wilkinson, Research Assoc.

Philately
Mr. D. Patrick, Hon. Curator

Textiles
Mr. H. B. Burnham, Curator
Mrs. K. B. Brett, Associate Curator
Dr. V. Gervers, Assistant Curator
Mr. J. Vollmer, Curatorial Asst.
Mrs. D. K. Burnham, Research Asst.

West Asian
Dr. T. C. Young Jr., Curator
Dr. L. B. Golombek, Assistant Curator
Dr. L. Levine, Assistant Curator
Dr. E. J. Keall, Assistant Curator
Dr. J. S. Holladay, Research Assoc.
Prof. Meredith-Owens, Res. Assoc.
Dr. H. B. Schroeder, Research Assoc.

Science Departments
Office of Chief Biologist
Dr. L. S. Russell, Chief Biologist

Botany
Mrs. L. Gad, Curatorial Asst.

Entomology and Invertebrate Zoology
Dr. G. B. Wiggins, Curator
Dr. D. Barr, Assistant Curator
Mr. T. Yamamoto, Curatorial Asst.
Mr. T. W. Beak, Research Associate
Dr. R. O. Brinkhurst, Research Assoc.
Dr. D. W. Crocker, Research Associate
Dr. F. P. Ide, Research Associate
Rev. J. C. E. Riotte, Research Assoc.

Geology
Dr. W. M. Tovell, Curator
Dr. J. H. McAndrews, Associate Curator
Dr. G. Norris, Research Assoc.
Prof. P. A. Peach, Research Associate

Ichthyology and Herpetology
Dr. W. B. Scott, Curator-in-Charge
Dr. E. J. Crossman, Curator
Dr. A. R. Emery, Research Associate
Dr. J. B. MacInnis, Research Assoc.
Mrs. I. Radforth, Research Associate
Mrs. M. G. Scott, Research Asst.

Invertebrate Palaeontology
Dr. D. H. Collins, Curator
Dr. Peter von Bitter, Asst. Curator
Mr. J. Monteith, Curatorial Assistant
Dr. C. R. Barnes, Research Associate
Dr. H. Brinckmann-Voss, Res. Assoc.
Mr. T. P. Fletcher, Research Assoc.
Prof. M. Fritz, Research Associate
Dr. J. B. Waterhouse, Research Assoc.
Dr. G. E. G. Westermann, Res. Assoc.

Mammalogy
Dr. R. L. Peterson, Curator
Dr. J. R. Tamsitt, Associate Curator
Miss J. Eger, Curatorial Asst.
Mr. S. Brock, Research Associate
Mrs. N. Curry, Research Assoc.
Dr. M. Brock Fenton, Research Assoc.
Dr. Darío Valdivieso, Research Assoc.
Mr. J. G. Williams, Research Assoc.

McLaughlin Planetarium
Dr. H. C. King, Curator
Dr. T. R. Clarke, Assistant Curator
Mr. N. Green, Assistant Curator
Mr. R. Ballantyne, Curatorial Assistant
Mr. H. Creighton, Curatorial Assistant
Mr. F. Jessop, Production Supervisor

Mineralogy
Dr. J. A. Mandarino, Curator
Dr. R. I. Gait, Associate Curator
Dr. F. J. Wicks, Assistant Curator
Mrs. S. Naldrett, Research Associate
Dr. J. Satterly, Research Associate
Mr. E. B. Tiffany, Research Associate
Mr. G. G. Waite, Research Associate
Mr. J. Weber, Research Associate

Ornithology
Dr. J. C. Barlow, Curator
Dr. D. M. Power, Associate Curator
Mr. J. A. Dick, Curatorial Assistant
Mrs. C. A. Goodwin, Curatorial Asst.

Mr. R. James, Curatorial Assistant
Miss V. Klemt, Research Assistant
Dr. W. W. H. Gunn, Research Assoc.
Rev. R. C. Long, Research Associate
Dr. J. Rising, Research Assoc.
Dr. H. Savage, Research Associate

Vertebrate Palaeontology
Dr. A. G. Edmund, Curator
Dr. C. McGowan, Assistant Curator
Mr. A. G. Hammond, Research Asst.
Dr. C. S. Churcher, Research Assoc.
Dr. T. S. Parsons, Research Assoc.

Service Departments

Book and Gift Shop
Mrs. H. R. Downie, Manager
Mrs. P. Dowton, Supervisor

Building Superintendent
Mr. A. Lawrence

Carpenters
Mr. A. Russell, Chief

Display Biology
Mr. T. M. Shortt, Chief

Display General
Mr. J. Anthony, Chief

Education
Miss N. E. Heakes, Head
Miss E. Berlin, Supervisor, S.M.C.
Miss M. C. Cumming, Lecturer
Miss A. Chrysler, Lecturer
Miss E. Clark, Lecturer
Miss M. Fitz-Gibbon, Lecturer
Miss N. Gahm, Lecturer
Mr. B. H. Johnston, Lecturer
Mrs. E. Ireland, Lecturer
Mrs. P. Isetta, Lecturer
Mrs. H. Tracy, Lecturer
Mr. C. Westcott, Research Assoc.

Information Services
Mr. Alex MacDonald, Information Officer
Miss C. Kanter, Information Assistant
Mrs. O. Koyama, Publications Editor
Mrs. B. Fischer, Special Projects
Mr. S. Thornley, Graphic Designer

Library
Mrs. E. Kulbaba, Head Librarian
Miss E. Dowie, Assistant Librarian
Miss R. Murray, Assistant Librarian
Mrs. M. Press, Assistant Librarian

Photography
Mr. L. Warren, Chief

Preparators
Mr. I. Lindsay, Chief

Registration
Miss D. Hecken, Registrar
Miss M. Shook, Assistant
Mrs. F. Stanley, Customs

The Main Building, 100 Queen's Park, Toronto 181
Open Mondays 10 a.m. to 5 p.m., Tuesday-Saturday to 9 p.m., Sundays 1 p.m. to 9 p.m. Tours Monday through Friday 12:15 p.m. October to May. For public information call 928-3690.

Sigmund Samuel Canadiana Building, 14 Queen's Park Crescent West, Toronto 182
Open weekdays 10 a.m. to 5 p.m., Sundays 1 p.m. to 5 p.m. Telephone 928-3710

McLaughlin Planetarium, 100 Queen's Park, Toronto 181
Open weekdays 10 a.m., Sundays 1 p.m. Telephone 928-8550. Star Theatre shows: Tuesday through Friday at 2, 3:30 and 8 p.m.; Saturday, 1, 2, 3:30, 7:30 and 9 p.m.; Sunday, 2, 3:30, 5 and 7:30 p.m. Star Theatre closed Mondays.

Membership Information:

The public is invited to join the Royal Ontario Museum and share in its activities. Membership includes free subscription to ROTUNDA; invitations to previews of exhibitions and new galleries; exclusive access to licensed Members' Lounge; free admission to lectures; ten per cent reduction at Sales Desk; advance information on coming events. Annual Membership is $15, Family Membership $25; Life Membership $200. For further information write: Membership Secretary, Royal Ontario Museum, 100 Queen's Park, Toronto 181, Ontario, or telephone 928-3704.

ROM